Sensata Technologies

121470E

OWNER'S MANUAL **MAY 2009**

ISO 9001:2000 Certified Company

Dimensions
DC to AC Power Inverters

12/1800N
12/2400N
12/3000N
12/3600N

Including Options: A, B1, D, R, T, T1

Form 121470

OWNERS MANUAL
FOR DIMENSIONS INVERTERS

Model 12/1800N
Model 12/2400N
Model 12/3000N
Model 12/3600N

Including Options: A, B1, D, R, T

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1. GENERAL

1.01 Dimensions inverters have been designed and manufactured for many user applications and long life. They utilize patented construction methods and high technology electronic parts and circuitry.

1.02 *CAUTION:* Inverters produce hazardous voltages, to avoid risk of harm or fire the unit must be properly installed. There are no user serviceable parts inside, do not remove the cover.

CAUTION: The inverter should not be mounted in a location that may be exposed to rain or spray.

CAUTION: The inverter should not be installed in a zero clearance enclosure.

CAUTION: Damage to the inverter will occur if correct polarity is not observed when installing the DC input cables.

CAUTION: Damage to the inverter will occur if an external AC power source is applied to the inverter's AC output or its hardwire output.

CAUTION: The inverter contains a circuit breaker and capacitor that may produce a spark. Do not mount in a confined battery or gas compartment.

CAUTION: Working in the vicinity of lead-acid batteries is dangerous. Batteries generate explosive gases during operation. There is a risk of acid exposure. There is also a risk of high current discharge from shorting the battery that can cause fire and explosion.

CAUTION: Be sure the inverter and, if used, the external AC input circuit breaker or fuse are turned"OFF" during installation.

2. DESCRIPTION

Inverter Rating

Inverter	Input		Output	
Model	(VDC)	(ADC)	(VAC)	(Watts)
12/1800N	12.6	Up to 180	120	1800
12/2400N	12.6	Up to 240	120	2400
12/3000N	12.6	Up to 300	120	3000
12/3600N	12.6	Up to 360	120	3600

2.01 The inverter converts 12 VDC to 120 VAC, 60 HZ, having a pure-sine wave form.

2.02 The inverter has internal protection against output short circuit, output overload and high temperature conditions. Also, there is a thermally controlled cooling fan.

2.03 The inverter is designed to operate any 120 VAC, 60 HZ single phase appliance, equipment or tool within its power ratings.

2.04 The battery charger ("B1" option) has sophisticated, patented recharge detection circuitry to ensure complete battery charging. It is fully automatic and regulated, and is temperature compensated.

3. INSTALLATION

3.01 The following instructions should be thoroughly read and understood before installation.

3.02 *CAUTION:* Inverters produce hazardous voltages, to avoid risk of harm or fire the unit must be properly installed.

CAUTION: Damage to the inverter will occur if correct polarity is not observed when installing the DC input cables.

CAUTION: Damage to the inverter will occur if an external AC power source is applied to the inverter's AC outlet or its hardwire output.

CAUTION: Be sure the inverter's circuit breaker or fuse (if needed) are turned "OFF" during installation.

NOTE: All wiring must follow the National Electric Code, Provincial or other codes in effect at the time of installation, regardless of suggestions in this manual. All wires should be copper conductors.

3.03 Mounting

3.03.1 Locate a suitable, secure vertical or horizontal mounting surface as close to the battery as possible without being in the same air tight compartment. The maximum recommended distance between the mounting location and the battery is 20 feet.

CAUTION: If mounting the inverter on a vertical surface, mount with the front control panel pointing down.

3.03.2 The location should provide adequate ventilation and clearance to maintain room temperature during operation. At least 1/2 inch of clearance is required on all sides.

3.03.3 Secure the unit with 1/4 inch screws or bolts in the mounting slots on the flanges of the chassis.

3.04 Chassis Bonding Lug - FIG. 1

3.04.1 Connect a #8 gauge or greater copper wire between the bonding lug on the inverter and the earth grounding system or the vehicle chassis.

3.05 Battery Cabling - FIG. 1

3.05.1 *CAUTION:* Assure that hydrogen gas does not accumulate near the battery by keeping the area well ventilated. A spark may result when connecting the final battery wiring due to the initial charging of the internal input capacitor.

3.05.2 Use stranded copper wire between the battery and inverter as indicated. UL requires that a line fuse be installed within 18 inches of the battery. Use only Bussmann ANN type fuses to 500A and Bussmann ANL for 600A .

DC Input Wire Lengths (maximum) and Fusing Guide

	Distance(feet)		
Model	1-10	11-15	16-20
12/1800N	2 ga	1 ga	1/0 ga
12/2400N	1/0 ga	2/0 ga	3/0 ga
12/3000N	2/0 ga	3/0 ga	4/0 ga
12/3600N	4/0 ga	4/0 ga	N/R

Fuse:	250A	300A	350A	400A	450A	500-600A
WGA:	2	1	1/0	2/0	3/0	4/0

3.05.3 NOTE: Using smaller input cable or longer length will greatly degrade the inverter peak performance. ***IMPORTANT NOTE FOR VEHICLE INSTALLATION:*** Do not use the vehicle chassis as the negative return in place of a return cable. Use the same size cable as the positive connection and run directly to the battery.

3.05.4 Install the wires at the battery, inverter and then fuse holder. Make sure that good, clean connections are made. Use care not to touch the positive and negative wires together. This will result in a violent spark and could result in exploding batteries and fire.

3.05.5 The battery input terminals are located in the wiring compartment. A mounting spark may result when connecting the battery wire, due to an initial charging of the internal input capacitor.

3.05.6 *CAUTION:* Connecting the inverter incorrectly to the battery will cause damage that is not covered under warranty.

3.06 Remote Switch for Inverter Operation - Fig. 1

3.06.1 All material used for the remote switch should be U.L. listed and installed per low voltage, Class 2, wiring code.

3.06.2 If the "R" option is included, then connect the cable from the remote panel/status lights with the mating connector extending from the inverter. Extention cable is available if necessary.

3.06.03 If the "R" option is not included, connect a single pole single throw "On/Off" switch using an 18-gauge wire to the "Remote Switch Hookup" violet wire lead ocated in the DC field wiring compartment. Disconnect the violet wire from the battery positive input terminal and connect it to the the load side of the remote switch. The line side of the switch must be connected to a +12VDC. Install a 5 Amp in-line fuse within 18" from the +12VDC source. The cable clamp strain relief should be used to secure the field wires.

3.06.4 The switch should be mounted at a convenient location in a listed outlet box with approved strain relief.

3.06.5 ***NOTE:*** A remote switch, if installed, will operate **only if** the local On/Off switch on the face of the inverter is turned "On". You may use several switches or relays in parallel in lieu of one remote switch.

3.07 Remote Temperature Sense ("B1" option)

3.07.1 A gray cable with temperature sense probe is provided with the unit. This allows the unit to know the exact battery temperature for correct operation of the charger temperature compensation circuitry.

3.07.2 Install the probe end on a NEGATIVE battery terminal post.

3.08 120 VAC Output

3.08.1 *CAUTION:* Do not connect another source of AC power directly to the output of the inverter. This will result in damage to the inverter that is not covered under warranty!

3.08.2 The 120 VAC output of the inverter is provided at the GFCI receptacle outlet on the inverter.

3.08.3 The output is also presented behind the wiring compartment panel using direct hardwire wire leads. The black wire is hot, the white wire is neutral and the green wire is ground. The cable clamp strain relief should be used to secure the field wires.

3.08.4 The hardwire A.C. output is not ground fault circuit interrupt, (GFCI) protected unless the inverter has option "A". GFCI outlets should be installed at all appropriate locations per NEC 551. The GFCI outlet should be Hubbell GFR5352XX (20A) or GFR5252XX (15A).

3.08.5 The remote AC outlets should be mounted at a convenient location in a listed outlet box with approved strain relief.

3.09 120/240 VAC Dual Output (D Option)

3.09.1 The output is presented behind the wiring compartment panel for direct hardwire wire leads. The two black wires are hot, the white wire is neutral and the green wire is ground. The cable strain relief should be used to secure the field wires.

3.10 120 VAC Input (T, T1, B1 options)

3.10.1 120 VAC, 60HZ power from the electric utility or generator can be connected to the inverter with hardwire connections at the AC Input wire leads provided in the hardwire compartment. The black wire is hot, the white wire is neutral, and the green wire is ground. The cable clamp strain relief should be used to secure the field wires.

3.10.2 The input circuit should have 30 amp circuit protection from the distribution panel (50 amp. for T1 option).

3.10.3 When external 120 VAC is supplied,

the internal transfer switch is automatically activated, the inverter is turned “Off”, and the inverter’s loads will operate from external AC input.

3.10.4 Units having the “B1” option require a separate 120 VAC, 20 amp input circuit. The "T" or "T1" option circuit activates the internal transfer switch supplying utility or generator power to the inverter’s output loads, and turns “Off” the inverter. The "B1" option input circuit activates the battery charger. Both the transfer switch input and the battery charger input must be connected to the same phase AC power source.

Charger Rating

Model	Input 120VAC, 60Hz	Output
12/1800N	Up to 15 Amp AC	85 Amp DC
12/3000N	Up to 20 Amp AC	105 Amp DC

4. START UP/OPERATION

4.01 The battery charger will operate anytime that there is external AC power and the battery is not 100% charged. The status lights will indicate that there is external power and the battery’s condition.

4.02 If the unit has the "B1" option, there are two switches on the right side that should be adjusted.

4.03 The switch labeled "Battery Type" should be set to the correct setting based on the composition of the batteries attached to the inverter. Use the following table to determine the correct setting.

BATTERY TYPE SELECTION

SETTING	BATTERY TYPE
A	Vented Nickel-Cadium 10 cells
B	Vented Lead-Acid (Antimony) Flooded Electrolyte
C	Sealed Lead-Acid Absorbed or Vented Nickel-Cadium 9 cell
D	Sealed Lead-Acid Gelled

NOTE: Used batteries should be put through 5 charge cycles with the switch set one position lower (to the right) than desired. Example: Start a used vented-lead acid battery on the "C" setting.

4.04 The switch labeled "Battery Size" should be set to the correct setting based on the total amp hour capacity of the batteries attached to the inverter. Use the following table to determine correct setting.

BATTERY CAPACITY SELECTOR

SETTING	AMP HOUR CAPACITY
A	Over 600
B	600 - 400
C	400 - 200
D	Less than 200

4.05 To operate the inverter, turn the On/Off switch to “ON”. Assure that the output breakers are reset. If a remote switch is used, the inverter is turned “On” or “Off” by the remote switch.

5. TROUBLESHOOTING

5.01 Dimensions offers free phone consultation concerning installation or troubleshooting. Call the Customer Service Department at:
1-800-553-6418 or 1-651-653-7000.
fax: 1-651-653-7600
e-mail: inverterinfo@sensata.net

5.02 If the inverter fails to operate correctly, use the following troubleshooting procedure.

5.02.1 Connect a 100 watt light bulb to the inverter output.

5.02.2 Make sure that the inverter is turned "On", and the circuit breakers are reset.

5.02.3 Check the connection to the remote switch, if used. +12 VDC **must** be present at the violet wire for the unit to operate. If not, check any fuses in the remote switch circuit.

5.02.4 Observe the fault indicating lights on the front of the inverter.

a) The Low input voltage light indicates a low battery condition. Switch the inverter "Off" for 5 seconds, then "On" again. The light coming on again indicates a fault in the battery wiring, battery capacity and voltage or the line fuse.

b) The Overload light indicates an output wiring short circuit or a load that is too large for the power rating of the inverter. Switch the inverter "Off", remove the short circuit or excessive load from the output, then switch the inverter back "On".

c) The High temperature light indicates the inverter has overheated. The unit will automatically turn back on when it has cooled to 40^0 C (104^0 F). Verify that the inverter is not in a closed compartment and that the fan is not blocked.

5.03 For units having the B1 option, when the battery charger fails to operate correctly check the inverter troubleshooting procedure in 5.02, verify that the remote temperature sense probe is installed correctly on the battery, then observe the front panel lights:

a) The External power light should be lit, the Power supply or the Battery charger light should be lit. If not, verify that the external power circuit is providing 120 VAC, 60HZ power to the unit. Check all external power wiring and external circuit breakers or fuses.

b) The green Timer Complete light indicates the unit's battery charger was unable to completely charge the battery(s) during the 12 hour charge cycle. One or more of the following conditions can cause this condition.

1) Verify that the two switch settings ("BATTERY TYPE" and "BATTERY BANK SIZE") are correctly set.

2) The charger was unable to detect the 80% charge level point during the 12 hour cycle due to a defective battery.

3) The battery's voltage dropped below 12.6 volts while the charger was attempting to detect the 80% charge level. A battery with a shorted cell or incorrect acid density can cause this condition.

4) More than 20 Amps of DC load current was drawn directly from the batteries during the charge cycle.

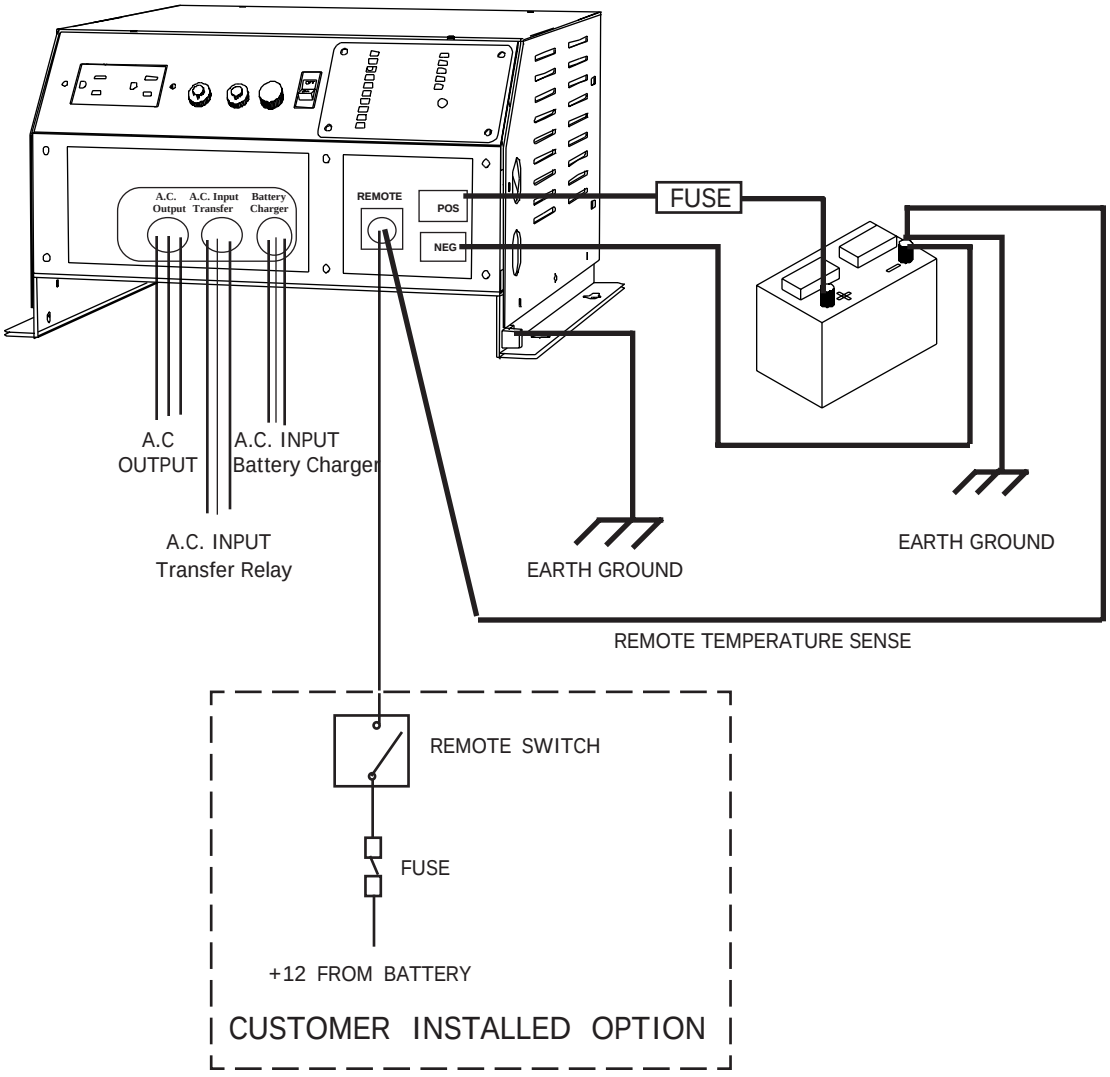
5) AC power loss (brown out) in the external AC input that limited the amount of AC power available to the battery charger.

5.04 A new charge cycle may correct the Timer Complete condition if the cause seems to be conditions 1, 4, or 5. The new charge cycle can be started by disconnecting both external AC inputs for 5 seconds then reconnecting them.

5.05 Call Airpax Dimensions, Inc. for technical assistance and/or a Return Authorization Number if the above steps are completed and the inverter or battery charger will not operate satisfactorily.

FIG. 1 INSTALLATION WIRING

WARNING: CONNECTING THE BATTERY WITH THE WRONG POLARITY TO THE INVERTER WILL CAUSE DAMAGE THAT IS NOT COVERED UNDER THE WARRANTY.



Limited Warranty Terms & Conditions

SHIPPING TERMS: F.O.B. St. Paul Minnesota. Freight prepaid and billed, subject to prior credit approval.

MINIMUM ORDER: $50.00 Net Price

LOSS OR DAMAGE: Loss or damage in transit are the responsibility of the carrier. Any claim should be filed with the delivering transport company. Invoice, Bill of Lading and Delivery receipt with damage noted therein must accompany any claims for freight damage. Claims for shortage and lost shipments must be made in writing to Sensata Technologies, Power Controls White Bear, St. Paul, MN within 10 days of date of shipment. Claims not reported within this time frame will not be honored.

PRICES: Prices are subject to change without notice. All orders are subject to acceptance at the factory. We reserve the right to invoice prices in effect at time of shipment.

TERMS: Net 30 days with approved credit, credit card or C.O.D.

RETURN GOODS POLICY:
o No returned materials will be accepted without an accompanying Returned Materials Authorization Number (RMA) from the factory.
o Credit will be issued for returned goods to the original purchaser within 60 days of purchase, provided the inverter is returned to Sensata unused and not mounted. The amount of credit will be issued at Sensata's discretion based on the condition of the product.
o Customer must be in good standing with Sensata Technologies.
o Inverters that are discontinued, high-voltage (over 24vdc), special-order or used are excluded and will not be eligible for credit. Non-inverter items such as cable assemblies, fuses and fuse holders, will not be eligible for credit
o Support components supplied by Sensata vendors will be covered under that manufacturer's credit return policy.
o Customer pays return freight.

PLEASE SHIP AUTHORIZED RETURNS TO:
Sensata Technologies | Power Controls White Bear | 4467 White Bear Parkway | St. Paul, MN 55110
Return Freight Prepaid

LIMITED WARRANTY:
Sensata Technologies extends the following warranty to the original purchaser of those goods subject to the qualifications indicated. Sensata warrants to the original purchaser for use that the goods or any component thereof manufactured by Sensata will be free from defects in workmanship from the date of purchase for the period listed on the product label, provided such goods are installed, maintained and used in accordance with Sensata and the original manufacturer's written instructions. Damages caused by the misuse, undue care or obvious wear through use will not be covered by this warranty.

Components not manufactured by Sensata, but used within the assembly provided by Sensata, are subject to the warranty period as specified by the individual manufacturer of said component, provided such goods are installed, maintained and used in accordance with Sensata and the manufacturer's written instructions.

Sensata sole liability and the Purchaser's sole remedy for a failure of goods under this limited warranty and for any and all claims arising out of the purchase and use of the goods, shall be limited to the repair or replacement of the goods that do not conform to this warranty.

To obtain repair or replacement service under the limited warranty, the purchaser must contact the factory for a Return Material Authorization (RMA). Once obtained, send the Return Material Authorization Number along with the defective part or goods to: Sensata Technologies, Power Controls White Bear, 4467 White Bear Parkway, St. Paul, MN 55110 Return Freight Prepaid
THERE ARE NO EXPRESS WARRANTIES COVERING THESE GOODS OTHER THAN AS SET FORTH ABOVE. THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED IN DURATION TO ONE YEAR FROM DATE OF PURCHASE.

SENSATA TECHNOLOGIES ASSUMES NO LIABILITY IN CONNECTION WITH THE INSTALLATION OR USE OF THE PRODUCT, EXCEPT AS STATED IN THIS LIMITED WARRANTY. SENSATA TECHNOLOGIES WILL IN NO EVENT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

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